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| 10/584,269 | 04/10/2007 | Haoyi Wan | 292986US8PCT | 5615 |

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| EXAMINER | |
|---|---|
| NICKERSON, JEFFREY L | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2442 | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/584,269 | WAN ET AL. | |
| | Examiner | Art Unit | |
| | JEFFREY NICKERSON | 2442 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *08 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

1. This communication is in response to Application No. 10/584,269 filed nationally on 10 April 2007 and internationally on 24 December 2004. The request for continued examination presented on 08 October 2009, which amends claims 1 and 6, and presents arguments, is hereby acknowledged. Claims 1-8 are currently pending and have been examined.

### *35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

### *Response to Arguments*

3. Applicant's arguments with respect to the rejections of claims 1-8 under 35 USC 103(a) have been considered but are moot in view of the new grounds of rejection, found below.

### *Claim Rejections*

4. Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al ("AOTO: Adaptive Overlay Topology Optimization in Unstructured P2P Systems", 04 December 2003); and in further view of Hsu (US 6,363,319 B1), and

Huang (US 2004/0264466 A1) as evidenced by Bettstetter ("On the Minimum Node Degree and Connectivity of a Wireless Multihop Network", 2002).

Regarding claim 1, Liu teaches a node device which newly joins a network formed by a first existing node and a second existing node (Liu: pg 4187, Figure 2), the node device comprising:

a virtual connection establisher unit configured to establish a first virtual connection with the first existing node and configured to establish a second virtual connection with the second existing node (Liu: pg 4186, section I, paragraphs 3-4 provides a newly connecting node goes out and identifies which nodes are its neighbors);

a total metric value calculator unit configured to calculate a first total metric value corresponding for the first virtual connection and configured to calculated a second total metric value for the second connection (Liu: pgs 4187, section II, subsection A provides for summing costs along a virtual connection; subsection B all paragraphs specify that a new node identifies its neighbors and builds a cost table for logical neighbors and provides for determining total costs by exchanging cost tables with neighbors); and

a connection establisher unit configured to establish a connection with the first existing node when the first total metric value is smaller than the second total metric value, and configured to establish a connection with the second existing node when the second total metric value is smaller than the first total metric value (Liu: pg 4187-4188,

section II, subsection B, paragraph 3 specifies the node only floods a message to the nodes with least cost, i.e. not non-flooding neighbors); and

wherein when calculating the first total metric value:

the total metric value calculator calculates a first weighted metric value based on the metric value of a route to the first existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2);

and also calculates a second weighted metric value based on a metric value of the route to the second existing node via the first existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2);

and the first total metric value is calculated as a sum of the first weighted value and the second weighted metric value (Liu: pg 4187, Section 2, subsection A provides for summing costs along a path; See also Figure 2); and

wherein when calculating the second total metric value:

the total metric value calculator calculates a third weighted metric value based on the metric value of a route to the second existing node (Liu: pg 4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2);

and also calculates a fourth weighted metric value based on a metric value of the route to the first existing node via the second existing node (Liu: pg

4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2);

and the second total metric value is calculated as a sum of the third weighted value and the fourth weighted metric value (Liu: pg 4187, Section 2, subsection A provides for summing costs along a second path; See also Figure 2); and

wherein a characteristic related to a node represents the number of adjacent nodes (Liu: pg 4188, section III, paragraph 1 specifies node degree is a common characteristics used in topology analysis; See also pg 4189, section III, subsection B, paragraph 3).

Liu does not teach wherein the respective weighted metric values are calculated by calculating a product of the respective metric value of the route with the respective weighting coefficient value;

wherein the weighting value represents a characteristic related to a node; or

wherein node degree is used in a path selection routing decision.

Hsu, in a similar field of endeavor, teaches wherein the respective weighted metric values are calculated by calculating a product of the respective metric value of the route with the respective weighting coefficient value (Hsu: abstract; Figures 6-7; col 6, lines 29--44; col 6, lines 56-67; provide the link cost is weighted by a dynamic factor based on current network attributes, such as bandwidth, normalized bandwidth availability, etc); and

wherein the weighting value represents a characteristic related to a node (Hsu: col 6, lines 45-67 provides for weighting with normalized link availability, among other things).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Hsu for weighting a metric based on dynamic network attributes. The teachings of Hsu, when implemented in the Liu system, will allow one of ordinary skill in the art to weight link costs in the total cost determination scheme. One of ordinary skill in the art would be motivated to utilize the teachings of Hsu in the Liu system in order to make link costs dynamic based on a multitude of network values and therefore more accurate depending on user needs.

The Liu/Hsu system does not teach wherein node degree is used in a path selection routing decision.

Huang, in a similar field of endeavor, teaches wherein node degree is used in a path selection routing decision (Huang: [0025]; [0028]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Huang for incorporating node degree in the route determination process. The teachings of Huang, when implemented in the Liu/Hsu system, will allow one of ordinary skill in the art to bias link costs based on current network attributes such as a target node's degree or connectivity. One of ordinary skill in the art would be motivated to utilize the teachings of Huang in the Liu/Hsu system in order to dynamically bias the link cost metric based on node degree, particularly when considering that node degree may be an indicator resiliency which

may be preferred in route selection (Bettstetter: pg 83, section 4.2, first paragraph, node degree indicates resilience of a node, which is generally preferred).

Regarding claim 2, the Liu/Hsu/Huang system teaches further comprising:

an acquirer unit configured to acquire, from at least one of the first existing node and the second existing node, a node-to-node connection information of an adjacent node to any other of the plurality of existing nodes forming the network (Liu: pgs 4187-4188, section II, subsection B, paragraph 1 specifies the node exchanges a neighboring cost table with each of its logical neighbors); and

wherein the weighted metric value calculator unit is configured to calculate the weighted metric value in accordance with the node-to-node connection information (Liu: pgs 4187-4188, section II, subsection B, paragraph 2 specifies exchanged neighboring cost tables are incorporated into the algorithm for building the spanning tree , i.e. its message flooding strategy).

Regarding claim 3, the Liu/Hsu/Huang system teaches wherein the node-to-node connection information includes a node ID (node number) for identifying the adjacent node, a metric value (cost) of a route between each of the first existing node and the second existing node to the adjacent node, and a number of the nodes adjacent to the adjacent node (Liu: pgs 4187-4188, section II, subsection B, all paragraphs specifies that cost tables maintain a cost between itself and all logical peers and that these tables are exchanged between immediately adjacent neighbors; therefore the received

exchanged table inherently contains an entry for every logical node adjacent to the immediate neighbor, therefore the exchanged cost table contains the number of nodes adjacent to the adjacent node; pg 4187, section II, subsection C, all paragraphs specify a minimizing algorithm that determines optimal flooding routes which inherently must contain some type of node identifier so that the node knows which nodes are which, and in the pseudo code Liu uses an integer node number).

Regarding claim 4, the Liu/Hsu/Huang system teaches wherein the metric value includes at least one of a number of hops, network bandwidth, communication costs, delay, load, MTU, or reliability (Liu: pgs 4187-4188, section II, subsection B, paragraph 1 specifies network delay is used for cost).

Regarding claim 6, this method claim comprises limitations corresponding to that of claim 1 and the same rationale of rejection is used, where applicable.

Regarding claim 7, the Liu/Hsu/Huang system teaches wherein the acquirer unit periodically acquires updated node-node connection information by broadcasting an update notification to the first existing node and the second existing node (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information; subsection C, last paragraph specifies can be periodic).

Regarding claim 8, this method claim comprises limitations corresponding to that of claim 7 and the same rationale of rejection is used, where applicable.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over by Liu et al ("AOTO: Adaptive Overlay Topology Optimization in Unstructured P2P Systems", 04 December 2003); in view of Hsu (US 6,363,319 B1), and Huang (US 2004/0264466 A1) as evidenced by Bettstetter ("On the Minimum Node Degree and Connectivity of a Wireless Multihop Network", 2002); and in further view of Traversat et al (US 2002/0147771 A1).

Regarding claim 5, the Liu/Hsu/Huang system teaches wherein the acquirer unit is configured to notify, the first existing and the second existing node, for the node-node connection information (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information); and

wherein response information is node-node connection information (Liu: pg 4187-4188, section II, subsection B, paragraph 2 specifies probing neighbors for cost information); and

wherein requested information is a metric value (Liu: pg 4187-4188, section II, subsection B, paragraph 2).

The Liu/Hsu/Huang system does not teach notifying a type of requested information or a combination of requested information to be included in the response information.

Traversat, in a similar field of endeavor, teaches notifying a type of requested information or a combination of requested information to be included in the response information (Traversat: [0350]-[0356] specifies that various peer information properties may be queried, such as uptime, credentials, etc).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the teachings of Traversat for requesting characteristics from another peer in the decentralized network. The teachings of Traversat, when implemented in the Liu/Hsu/Huang system, will allow one of ordinary skill in the art to form greedy and dynamic cost tables by requesting information relevant to a node's own interests. One of ordinary skill in the art would be motivated to utilize the teachings of Traversat in the Liu/Hsu/Huang system in order to provide a more wholesome cost table, incorporating more variables into a cost equation, and fleshing out its effectiveness.

***Citation of Pertinent Prior Art***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Masssoulie et al (US 2005/0060429 A1) discloses a system that organizes (and periodically reorganizes) an overlay topology based on link costs, among other things.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEFFREY NICKERSON whose telephone number is (571)270-3631. The examiner can normally be reached on M-Th, 9:00am - 7:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Saleh Najjar can be reached on (571)272-4006. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. N./
Examiner, Art Unit 2442

/Faruk Hamza/
Examiner, Art Unit 2455